

least one element of main groups III to VII in at least one sol which is a metal oxide sol, semimetal oxide sol or a mixed metal oxide sol to a perforated and permeable mesh carrier and subsequently heating at least once during which the suspension comprising at least one inorganic component is solidified on and in the carrier, wherein the ratio of the particle size of the suspended component to the mesh or pore opening of the mesh support is from 1:1000 to 50:1000 and wherein the composite material has a thickness from 5 to 1000  $\mu\text{m}$ , and wherein the mesh opening of the support is 50 to 500  $\mu\text{m}$ .

67. (New) Composite according to Claim 66, wherein the composite is permeable for gases, solids or liquids.

68. (New) Composite according to Claim 66, wherein the composite is permeable for particles with a size of 0.5 nm to 10  $\mu\text{m}$ .

69. (New) Composite according to Claim 66, wherein the carrier contains fibers from at least one of the following materials: carbon, glass, metals, alloys, ceramic materials, minerals, plastics, amorphous substances, natural products, composites or at least one combination of these materials.

70. (New) Composite according to Claim 66, wherein the carrier contains at least woven fibers made from metal or alloys.

71. (New) Composite according to Claim 66, wherein the carrier contains at least one mesh made from steel.

72. (New) Composite according to Claim 66, wherein an inorganic component, which contains at least one compound containing at least one metal, metalloid or composition metal with at least one element from group III to VII of the periodic system or at least one mixture of these compounds, contains at least one compound of the transition element groups and of the element of group III to V of the periodic system or at least one compound of the

transition element groups or of the elements of group III to V of the periodic system, whereby the compounds have a particle size of 0.001 to 25  $\mu\text{m}$ .

73. (New) Composite according to Claim 72, wherein the inorganic component contains at least one compound containing at least one of the elements Sc, Y, Ti, Zr, Nb, V, Cr, Mo, W, Mn, Fe, Co, B, Al, In, Ti, Si, Ge, Sn, Pb, Sb and Bi, with at least one of the elements Te, Se, S, O, Sb, As, P, N, C, and Ga.

74. (New) Composite according to Claim 66, wherein the composite contains at least two particle size fractions of at least one inorganic component.

75. (New) Composite according to Claim 74, wherein the particle size fraction in the composite contains a particle size ratio of 1:1 to 1:100.

76. (New) Composite according to Claim 74, wherein the composite contains a quantitative proportion of particle size fraction of between 0.01 to 1 and 1 to 0.01.

77. (New) Composite according to Claim 66, wherein the composite is flexible to a smallest radius of up to 2 nm.

78. (New) Process of preparing a composite as claimed in Claim 66, wherein at least one suspension, which contains at least one inorganic component consisting of at least one compound of at least one metal, one metalloid or one composition metal with at least one of the elements from group III to VII of the periodic system, and a sol is applied to at least one perforated and permeable carrier, and wherein the suspension is stabilized on and in the carrier material by being heated at least once.

79. (New) Process according Claim 78, wherein the suspension is applied onto or into or onto and into at least one carrier by stamping on, pressing on or in, rolling on, applying with a blade or brush, dipping, spraying, or pouring.

80. (New) Process according to Claim 78, wherein a perforated and permeable carrier is used that contains one of the following materials: carbon, metals, alloys, glass, ceramic materials, plastics, amorphous substances, natural products, composites or at least one combination of these materials.

81. (New) Process according to Claim 78, wherein the sols are obtained by hydrolyzing at least one metallic compound, at least one metalloid compound or at least one composition metallic compound with one liquid, one gas or one solid.

82. (New) Process according to Claim 81, wherein water, water vapor, ice, alcohol or an acid or a combination of these compounds is used as the one liquid, the one gas or the one solid for the hydrolysis of the metallic compound.

83. (New) Process according to Claim 81, wherein the compound to be hydrolyzed is placed in alcohol or in an acid or a combination thereof before hydrolysis.

84. (New) Process according to Claim 81, wherein at least one metal nitrate, metal chloride, metal carbonate, one metal alcoholate compound or at least one metalloid alcoholate compound is hydrolyzed.

85. (New) Process according to Claim 84, wherein at least one metal alcoholate compound or at least one metalloid alcoholate compound from the alcoholate compounds of the elements Ti, Zr, Al, Si, Sn, Ce and Y or at least one metal nitrate, metal carbonate or metal halogenide from the metallic salts from the elements Ti, Zr, Al, Si, Sn, Ce and Y is hydrolyzed.

86. (New) Process according to Claim 81, wherein the hydrolysis of the compounds to be hydrolyzed is carried out with at least half the molar ratio of water, in relation to the hydrolyzable group of the hydrolyzable compound.

87. (New) Process according to Claim 81, wherein the hydrolyzed compound is treated with at least one organic or inorganic acid.

88. (New) Process according to Claim 87, wherein the organic or inorganic acid has a concentration of 10 to 60 %.

89. (New) Process according to Claim 78, wherein at least one inorganic component is suspended in a sol.

90. (New) Process according to Claim 89, wherein an inorganic component is suspended that contains at least one compound from the following: metallic compounds, metalloid compounds, composition metallic compounds or metallic mixture compounds with at least one element from group III to VII or the periodic system, or at least one mixture of these compounds.

91. (New) Process according to Claim 89, wherein an inorganic component is suspended that contains at least one compound from the oxides of the elements of the transition element groups or the elements from group III to V of the periodic system.

92. (New) Process according to Claim 91, wherein the oxides are selected from oxides of the elements Sc, Y, Ti, Zr, V, Cr, Nb, Mo, W, Mn, Fe, Ce, Co, B, Al, In, TI, Si, Ge, Sn, Pb and Bi.

93. (New) Process according to Claim 78, wherein the percentage by mass of the suspended components is 0.1 to 500 times the amount of hydrolyzed compound used.

94. (New) Process according to Claim 78, wherein the suspension on or in or on and in the carrier is stabilized by heating the composite to between 500 and 1000 °C.

95. (New) Process according to Claim 94, wherein the composite is subjected to a temperature of between 50 and 10 °C for 10 minutes to 5 hours.

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96. (New) Process according to Claim 94, wherein the composite is subjected to a temperature of between 100 and 800 °C for 1 second to 10 minutes.

97. (New) A process for the separation of material mixtures comprising filtering material mixtures through the composite of Claim 66 to separate components thereof.

98. (New) A process for the separation of liquid mixtures, mixtures containing at least one liquid and at least one gas, mixtures containing at least one solid and at least one liquid, and mixtures containing at least one gas and at least one solid or at least one liquid or one gas comprising filtering said mixtures through the composite of Claim 66 to separate components thereof.

99. (New) A process for pressurized separation (process) comprising filtering a mixture of materials under pressure with the composite of Claim 66 to separate components thereof.

100. (New) A process for micro-filtration, ultra-filtration or nano-filtration comprising filtering micro-sized, ultra-sized or nano-sized particle containing mixtures through a membrane of the composite of Claim 66 to separate the micro-sized, ultra-sized or nano-sized particles.

101. (New) A process comprising carrying out a catalytic process with the composite of Claim 66.

102. (New) A formselective membrane comprising the composite of Claim 66.

103. (New) A wound module comprising the form-selective membrane of Claim 102.

104. (New) A flat module comprising the form-selective membrane of Claim 102.

105. (New) A diaphragm or battery separator comprising the composite of Claim 66.